Bachelor of Engineering (Software Engineering) (IX25)

Year offered: 2010
Admissions: No
CRICOS code: 053707D
Course duration (full-time): 4 years
Domestic fees (indicative): 2010: CSP $3,200 (indicative) per semester
International Fees (indicative): 2010: $11,500 (indicative) per semester
Domestic Entry: February
International Entry: February
QTAC code: 419502
Past rank cut-off: 76
Past OP cut-off: 12
OP Guarantee: Yes
Assumed knowledge: English (4, SA) and Maths B (4, SA)
Preparatory studies: For information on acquiring assumed knowledge visit http://www.studentservices.qut.edu.au/apply/ug/info/knowledge.jsp
Total credit points: 384
Standard credit points per full-time semester: 48
Course coordinator: Dr R.Mahalinga-Iyer
Discipline coordinator: Dr Jasmine Banks
Campus: Gardens Point

DISCONTINUATION
As of Semester 1 2009, IX25 has been discontinued. Software Engineering is now available in the EN40 Bachelor of Engineering course.

Special Note
Any remaining students should seek advice from the Course Coordinator regarding their remaining course program.

Further Information
For further information about this course, please contact:

Phone +61 7 3138 2678
Fax +61 7 3138 1515
Email: bee.enquiries@qut.com

Full-time Course structure - Students who commenced in 2008

Year 1 - Semester 1
BEB100 Introducing Professional Learning
INB104 Building IT Systems
OR (prior to 2008)
ITB001 Problem Solving and Programming
MAB180 Engineering Mathematics 1B
OR

Year 1 - Semester 2
BEB200 Introducing Sustainability
ENB103 Electrical Engineering
INB270 Programming
OR (prior to 2008)
ITB003 Object Oriented Programming
MAB132 Engineering Mathematics 2A
OR
MAB182 Engineering Mathematics 2B

Year 2 - Semester 1
ENB240 Introduction To Electronics
ENB242 Introduction To Telecommunications
INB251 Networks
MAB233 Engineering Mathematics 3

Year 2 - Semester 2
ENB243 Linear Circuits and Systems
ENB244 Microprocessors and Digital Systems
INB210 Databases
INB271 The Web
OR
INB272 Interaction Design

Year 3 - Semester 1
ENB350 Real-time Computer-based Systems
ENB354 Introduction To Systems Design
INB370 Software Development
INB371 Data Structures and Algorithms

Year 3 - Semester 2
ENB352 Communication Environments For Embedded Systems
ENB355 Advanced Systems Design
INB301 The Business of IT
INB372 Agile Software Development

Year 4 - Semester 1
INB255 Security
INB350 Internet Protocols and Services
**Electives**

- Students are required to undertake 3 electives as follows: 2 from Electrical Engineering and 1 from Information Technology.
  - Electrical Engineering Electives (2 to be selected):
    - Any 3rd or 4th year electrical ENB unit approved by the course coordinator.
  - Information Technology Electives (1 to be selected):
    - Web Application Development
    - Systems Programming
    - Modelling and Animation Techniques
    - Real Time Rendering Techniques
    - Or any 3rd or 4th year IT unit approved by the course coordinator.

### Full-time Course structure - Students who commenced in 2007

#### Year 1 - Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEB100</td>
<td>Introducing Professional Learning</td>
</tr>
<tr>
<td>INB104</td>
<td>Building IT Systems</td>
</tr>
<tr>
<td>ITB001</td>
<td>Problem Solving and Programming</td>
</tr>
<tr>
<td>MAB180</td>
<td>Engineering Mathematics 1B</td>
</tr>
<tr>
<td>MAB131</td>
<td>Engineering Mathematics 1A</td>
</tr>
<tr>
<td>PCB136</td>
<td>Engineering Physics 1C</td>
</tr>
</tbody>
</table>

#### Year 1 - Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEB200</td>
<td>Introducing Sustainability</td>
</tr>
<tr>
<td>INB309-1</td>
<td>Major Project</td>
</tr>
<tr>
<td>BEB801</td>
<td>Project 1</td>
</tr>
</tbody>
</table>

### Year 2 - Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB103</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>INB270</td>
<td>Programming</td>
</tr>
<tr>
<td>ITB003</td>
<td>Object Oriented Programming</td>
</tr>
<tr>
<td>MAB132</td>
<td>Engineering Mathematics 2A</td>
</tr>
<tr>
<td>MAB182</td>
<td>Engineering Mathematics 2B</td>
</tr>
</tbody>
</table>

#### Year 2 - Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>INB373</td>
<td>Web Application Development</td>
</tr>
<tr>
<td>INB365</td>
<td>Systems Programming</td>
</tr>
<tr>
<td>INB381</td>
<td>Modelling and Animation Techniques</td>
</tr>
<tr>
<td>INB382</td>
<td>Real Time Rendering Techniques</td>
</tr>
</tbody>
</table>

### Year 3 - Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB350</td>
<td>Real-time Computer-based Systems</td>
</tr>
<tr>
<td>ENB354</td>
<td>Introduction To Systems Design</td>
</tr>
<tr>
<td>INB370</td>
<td>Software Development</td>
</tr>
<tr>
<td>ITB749</td>
<td>Scientific Programming</td>
</tr>
<tr>
<td>INB371</td>
<td>Data Structures and Algorithms</td>
</tr>
</tbody>
</table>

### Year 3 - Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB352</td>
<td>Communication Environments For Embedded Systems</td>
</tr>
<tr>
<td>ENB355</td>
<td>Advanced Systems Design</td>
</tr>
<tr>
<td>INB301</td>
<td>The Business of IT</td>
</tr>
<tr>
<td>ITB009</td>
<td>Core Project Management</td>
</tr>
<tr>
<td>INB372</td>
<td>Agile Software Development</td>
</tr>
<tr>
<td>ITB712</td>
<td>Software Engineering Principles</td>
</tr>
</tbody>
</table>
### Year 4 - Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INB255</td>
<td>Security</td>
<td>ITB730 Information Security Fundamentals</td>
</tr>
<tr>
<td>INB350</td>
<td>Internet Protocols and Services</td>
<td>ITB720 Internet Protocols and Services</td>
</tr>
<tr>
<td>INB309-1</td>
<td>Major Project</td>
<td>INB270 Programming</td>
</tr>
<tr>
<td>BEB801</td>
<td>Project 1</td>
<td>MAB180 Engineering Mathematics 1B</td>
</tr>
<tr>
<td>BES802</td>
<td>Project 2</td>
<td>MAB131 Engineering Mathematics 1A</td>
</tr>
</tbody>
</table>

### Year 4 - Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEB701</td>
<td>Work Integrated Learning 1</td>
<td>ITB003 Object Oriented Programming</td>
</tr>
<tr>
<td>INB309-2</td>
<td>Major Project</td>
<td>MAB132 Engineering Mathematics 2A</td>
</tr>
<tr>
<td>BEB802</td>
<td>Project 2</td>
<td>MAB182 Engineering Mathematics 2B</td>
</tr>
</tbody>
</table>

### Electives

Students are required to undertake 3 electives as follows: 2 from Electrical Engineering and 1 from Information Technology.

- Electrical Engineering Electives (2 to be selected):
  - Any 3rd or 4th year electrical ENB unit approved by the course coordinator.
- Information Technology Electives (1 to be selected):
  - INB373 Web Application Development
  - INB365 Systems Programming
  - INB381 Modelling and Animation Techniques
  - INB382 Real Time Rendering Techniques
- Or any 3rd or 4th year IT unit approved by the course coordinator.

### Full-time Course structure - Students who commenced in 2006

### Year 1 - Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INB104</td>
<td>Building IT Systems</td>
<td>ITB006 Networks</td>
</tr>
<tr>
<td>ITB001</td>
<td>Problem Solving and Programming</td>
<td>MAB180 Engineering Mathematics 1B</td>
</tr>
<tr>
<td>INB251</td>
<td>Networks</td>
<td>MAB131 Engineering Mathematics 1A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PCB136 Engineering Physics 1C</td>
</tr>
</tbody>
</table>

### Year 1 - Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BES100</td>
<td>Introducing Professional Learning</td>
<td>ITB004 Database Systems</td>
</tr>
<tr>
<td>ENB103</td>
<td>Electrical Engineering</td>
<td>MAB233 Engineering Mathematics 3</td>
</tr>
<tr>
<td>INB270</td>
<td>Programming</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Year 2 - Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB240</td>
<td>Introduction To Electronics</td>
<td>ITB007 Web Development</td>
</tr>
<tr>
<td>ENB242</td>
<td>Introduction To Telecommunications</td>
<td></td>
</tr>
<tr>
<td>INB270</td>
<td>Programming</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Year 2 - Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEB200</td>
<td>Introducing Sustainability</td>
<td></td>
</tr>
<tr>
<td>ENB243</td>
<td>Linear Circuits and Systems</td>
<td></td>
</tr>
<tr>
<td>ENB244</td>
<td>Microprocessors and Digital Systems</td>
<td></td>
</tr>
<tr>
<td>INB271</td>
<td>The Web</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Year 3 - Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB350</td>
<td>Real-time Computer-based Systems</td>
<td>ITB749 Scientific Programming</td>
</tr>
<tr>
<td>ENB354</td>
<td>Introduction To Systems Design</td>
<td>INB372 Agile Software Development</td>
</tr>
<tr>
<td>INB370</td>
<td>Software Development</td>
<td>OR (prior to 2008)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Year 3 - Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB350</td>
<td>Real-time Computer-based Systems</td>
<td></td>
</tr>
<tr>
<td>ENB354</td>
<td>Introduction To Systems Design</td>
<td></td>
</tr>
<tr>
<td>INB370</td>
<td>Software Development</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>OR (prior to 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB712</td>
<td>Software Engineering Principles</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
UNIT SYNOPSES

BEB100 INTRODUCING PROFESSIONAL LEARNING
This unit will introduce students to a range of skills and knowledge sets required to support professional practice in design, engineering and urban development disciplines. It will include information literacy and communication skills and knowledge development. In addition, the unit will provide orientation to design, engineering and urban development professions through an introduction to their history, their place in society, the importance of ethical conduct to their practice and to the particular qualities of professional knowledge especially with regard to practice knowledge. The importance of integrated scholarship and collaborative links with other professions will be highlighted.

Equivalents: BNB007, CNB190, PSB414  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point

BEB200 INTRODUCING SUSTAINABILITY
This unit will address issues of sustainability from a number of perspectives thus providing students with a variety of lenses on the ways in which the human-made environment impacts on the future of human settlement. The unit will include an introduction to sustainability from a variety of perspectives, including indigenous and other cultural perspectives, and from ecological, economic and technological perspectives. It will demonstrate to students the ways in which contrasting, and sometimes conflicting, ideas about sustainability are prioritised and how these priorities contribute to the impact that design, engineering and urban development professions have on a sustainable future.

Equivalents: PSB422  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point

BEB701 WORK INTEGRATED LEARNING 1
This unit aims to provide you with the opportunity to learn in a workplace environment. It will involve attendance, participation, observation, critical reflection, and report writing on workplace activities. The emphasis of your critical reflection and report writing will be on identifying and describing aspects of professional relevance incorporating: collaboration and teamwork; workplace, health and safety; professional conduct; ethical responsibility, and other aspects of your workplace experience.

This unit may form part of your (compulsory) course core (as required by professional accrediting bodies e.g. Engineers Australia, Australian Institute of Building, Royal Institution of Chartered Surveyors), or it may be one of several work integrated learning (WIL) units (selected as part of a Minor).

Prerequisites: 192cp of completed studies  Credit points: 12  Campus: Gardens Point  Teaching period:
2010 SEM-1, 2010 SEM-2 and 2010 SUM

**BEB801 PROJECT 1**
This unit is usually taken in the final year of study. Students complete an individual project involving the application of skills and knowledge attained during the earlier years of their degree program. For some students, this unit will be taken one of two ‘project’ units related to the same student project; in such cases this unit may be a pre-requisite or co-requisite to the second unit (or a follow-on from the first unit). The final ‘deliverable’ for this unit may vary for each discipline and details will be provided in lectures/tutorials and on the Blackboard website.

**Equivalents:** CEB411, CEB420, CNB434, EEB781-1, EEB889-1  
**Credit points:** 12  
**Contact hours:** 2 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**BEB802 PROJECT 2**
This unit is usually taken in the final year of study, and is only taken by students completing a two unit project. Students complete an individual project involving the application of skills and knowledge attained during the earlier years of their degree program. This unit will be taken as the second of two ‘project’ units related to the same student project.

**Equivalents:** CEB415, EEB782-2, EEB889-2  
**Credit points:** 12  
**Contact hours:** 2 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**ENB242 INTRODUCTION TO TELECOMMUNICATIONS**
Telecommunications systems and the principles underlying their operations are introduced starting from mathematical preliminaries such as the Fourier series and the Fourier transform. Analogue modulation techniques (AM and FM), systems and circuits for generation and demodulation, analogue to digital conversion, pulse modulation and baseband digital data communication techniques are studied using time and frequency domain analyses.

**Prerequisites:** (ENB120 or ENB103) and (MAB126 or MAB110 or MAB111)  
**Equivalents:** EEB340  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**ENB243 LINEAR CIRCUITS AND SYSTEMS**
Network analysis: Laplace transform of signals and transfer functions of systems, time and frequency responses of linear circuits, feedback configurations and transfer functions, analyse and designing analogue systems using transistors and operational amplifiers, designing and synthesising analogue filters, signal conditioning.

**Prerequisites:** ENB120 and MAB126  
**Assumed knowledge:** ENB240 is assumed knowledge.  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**ENB244 MICROPROCESSORS AND DIGITAL SYSTEMS**
This unit covers the basis for electronic circuit design in general but also in connection with microprocessor systems, theory and design of advanced embedded digital systems and practical implementation. The practical application of these circuits including interfacing and environment factors will be considered.

**Prerequisites:** ENB240  
**Assumed knowledge:** ENB246 or INB104 is assumed knowledge.  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**ENB350 REAL-TIME COMPUTER-BASED SYSTEMS**
This unit covers the area of embedded systems and real-time kernels. C programming is reviewed in the context of real-time applications where it is often mixed with assembly language. Data representations, input-output programming, concurrency, scheduling, memory management and system initialisation are discussed. Programming laboratory exercises introduce development tools and reinforce fundamental concepts such as polling, interrupt driven input-output, serial port communication, pre-emptive and non pre-emptive scheduling, resource sharing, priority inversion and deadlock. Students develop a simple real-time process control application using programmable logic and micro-controllers.

**Prerequisites:** ENB244  
**Equivalents:** EEB3566  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:**
ENB352 COMMUNICATION ENVIRONMENTS FOR EMBEDDED SYSTEMS
This unit addresses the following: computer networks; network programming; open network foundations; embedded systems; client/server; bus architectures; network controllers; distributed systems in automation and process control; embedded Java; distributed objects; distributed databases; distributed operating systems.
Prerequisites: ENB350  Equivalents: EEB666  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

ENB354 INTRODUCTION TO SYSTEMS DESIGN
Introduction systems engineering methodologies and techniques as applied to Aerospace Engineering projects. The students receive formal lectures and apply the knowledge gained to a specific case study or mini project.
Equivalents: EEB585  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

ENB355 ADVANCED SYSTEMS DESIGN
Students apply the systems engineering documentation and specifications developed in ENB345 Introduction to Systems Design and complete the project to the final systems engineering review stage.
Prerequisites: ENB354  Equivalents: EEB685  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

INB104 BUILDING IT SYSTEMS
This team-based unit is an integrated introduction to information technology designed to engage, inspire and inform and will demonstrate the important role that technical system design and development plays in achieving robust operation of a large variety of technological solutions. This unit will give you substantial hands-on, practical learning experiences and will motivate you through engagement in the creative, explorative and meaningful development of technological artefacts that operate in real world contexts.
Prerequisites: ITB001  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1 and 2010 SEM-2

INB210 DATABASES
The aim of this unit is to help you develop your knowledge, understand a formal specification tool (ORM) for modelling information systems unambiguously and to apply this formal technique to conceptualise information systems found in many real world application domains.
Assumed knowledge: Students are expected to have solid IT background knowledge (e.g., completion of at least 192 credit points)  Equivalents: ITB004, ITB115  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

INB251 NETWORKS
Computer systems and communications networks are essential to the activities of modern organisations. When you graduate from a course in Information Technology, employers expect you to have a sound understanding of the terminology and concepts of computer systems, communications networks, and network services. This unit provides you with an introductory study of communications network technologies and network applications. The unit serves as an entry point to further specialised studies in the field of computer network systems.
Antirequisites: ITB006  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

INB255 SECURITY
This unit aims to give you an understanding of the major issues in information security. You will be able to identify critical information security concepts and determine the information security implications of interactions between entities. You will have knowledge of a range of techniques for protecting information, and understand the limitations of these techniques. You will be aware of international information security management standards.
Antirequisites: ITB161, ITB523, ITB623 and ITN161  Equivalents: ITB730  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

INB270 PROGRAMMING
This unit aims to give you a positive introduction to the skills required in solving computational problems and implementing solutions in a programming or scripting language. Although some theoretical aspects of computer programming are introduced briefly, the overall emphasis of the unit is programming practice. The unit emphasises generic programming concepts and related problem-solving strategies. The skills you learn in this unit will be applicable to a wide variety of commonly-used, industrially-significant programming and scripting languages.
Prerequisites: INB104 or ENB246  Antirequisites: ITB003, ITB112, ITB411, INN270  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

INB271 THE WEB
The aims of the unit are to give you a thorough understanding of what the web is, how it works and what it has to offer. Additionally, the unit aims to give you a general understanding and basic skills in developing dynamic web applications, including an appreciation of the variety of implementation technologies available. Through an understanding of how web technologies have evolved to date, you will appreciate the necessity for lifelong learning and become an insightful predictor of future developments in this area. You will learn to critically analyse technological alternatives in order to adapt to and innovate with technologies that presently do not exist. You will appreciate the business or organizational context within which web applications exist and be skilled in communicating within that environment. You will appreciate the social and ethical issues relating to web based systems including accessibility, globalization, privacy, and piracy.

Prerequisites: INB104  Antirequisites: INB373 and INN373 and ITB007 and ITB227 and ITN007 and ITN227  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

INB272 INTERACTION DESIGN
The aim of this unit is to provide you with an understanding of the theory, practices and challenges associated with the development of creative interactive design and human computer interaction.

Prerequisites: INB103 or INB181  Equivalents: ITB254  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

INB301 THE BUSINESS OF IT
As an IT professional you are more and more evaluated in terms of the business value that you produce. This unit will prepare you for professional practice by making you "business savvy," i.e. giving you the business knowledge and skills that will help you with your future career and job. In particular the unit will address three themes: (1) career planning and job applications, (2) entrepreneurship & innovation, and (3) business and IT strategy. You will be introduced to career development tools that enable you to self-manage your career and life. You will learn how to critically think about the requirements of a job and reflect upon your own experiences and learn how to communicate them. You will also learn about the entrepreneurial process of identifying a business opportunity and how to take advantage of that opportunity. In addition, you will gain an understanding of core strategic concepts and models, discuss typical strategy tools and then apply them to the 'Business of IT'.

Antirequisites: ITB009  Assumed knowledge: Completion of 120 credit points within BIT is assumed  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1 and 2010 SEM-2

INB309 MAJOR PROJECT
This unit gives you the opportunity to apply, under appropriate guidance, the knowledge and skills gained in your course to date and to execute a substantial development project over two semesters. The ability to apply technical knowledge and skills to real-life situations is essential for information technology professionals. A substantial project, under academic supervision, will develop your initiative and ability to apply your knowledge and skills in a professional capacity. Completing the project will also enable you to appreciate the complementary nature of the course material in total, particularly the need for careful project management.

Prerequisites: INB101 and INB102 and INB103 and INB104 and INB201  Assumed knowledge: Completion of at least 144 credit points of IT units, including INB101, INB102, INB103, INB104, INB201 and four Breadth option and one specialisation option units is assumed knowledge.  Equivalents: ITB844  Credit points: 12  Contact hours: 3 per week  Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

INB309 MAJOR PROJECT
This unit gives you the opportunity to apply, under appropriate guidance, the knowledge and skills gained in your course to date and to execute a substantial development project over two semesters. The ability to apply technical knowledge and skills to real-life situations is essential for information technology professionals. A substantial project, under academic supervision, will develop your initiative and ability to apply your knowledge and skills in a professional capacity. Completing the project will also enable you to appreciate the complementary nature of the course material in total, particularly the need for careful project management.

Prerequisites: INB309-1 (can be enrolled in the same teaching period)  Antirequisites: ITB844  Assumed knowledge: Completion of at least 144 credit points of IT units, including INB101, INB102, INB103, INB104, INB201 and four Breadth option and one specialisation option units is assumed knowledge.  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

INB350 INTERNET PROTOCOLS AND SERVICES
An understanding of the theoretical and practical concepts of network protocols and services is highly useful and relevant to network engineers and others working in the Information Processing industries. This unit introduces you to Internet protocols and the design, implementation and
operation of network based applications. Theory and practical skills taught in this unit will be useful if you intend undertaking further networking units.

**Prerequisites:** INB251 or ITB006 or ITB510  
**Antirequisites:** ITB264, ITB629, ITB720, ITN525, ITN667, ITN720  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**INB365 SYSTEMS PROGRAMMING**  
Systems programming is an essential part of any computer-science education. This unit uses operating system concepts to teach the foundations of systems programming and advanced concepts for producing softwares that provide services to computer hardware. Through this study, you will be able to demonstrate knowledge of the principles and techniques of process management, memory and file management, protection & security, and distributed systems.

**Prerequisites:** INB270  
**Antirequisites:** INN365, ITB745, ITB706  
**Assumed knowledge:** Fundamentals of computer architecture; high level programming languages (such as C, C++, Java Python) is assumed knowledge.  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**INB370 SOFTWARE DEVELOPMENT**  
Understanding software development is an integral part of the IT industry for software engineers. Software development relies on object technologies, programming techniques and numerous code libraries provided by language developers and third party vendors. Integrated Development Environments, unit testing frameworks, automated and continuous build tools and versioning systems are all becoming part of the tool set modern software developers must be familiar with. This unit is designed to introduce these technologies and techniques to show how software can be rapidly developed.

**Prerequisites:** INB270 or ITB003 or INN270  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**INB371 DATA STRUCTURES AND ALGORITHMS**  
The purpose of this unit is to ensure that you have a sound knowledge of modern programming techniques and their use in providing medium-scale software solutions. This unit will teach you to decompose a problem and produce a modular solution to a programming task. The principles to analyse algorithms for efficiency will also be introduced. In addition, you will acquire the necessary skills for you to use the tools available in common development environments, such as Microsoft Visual Studio.

**Prerequisites:** INB371 and MAB281  
**Equivalents:** ITB746  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**INB372 AGILE SOFTWARE DEVELOPMENT**  
This unit introduces you to the software development process. You will look at each of the major activities involved in developing a software system. You will also learn how to manage and control the software development process for a large project when a number of team members are involved in the development. This unit develops the professional practice of working on large software systems.

**Prerequisites:** INB370  
**Antirequisites:** INN372, ITB612, ITB712  
**Assumed knowledge:** Good programming, debugging, testing and software development skills.  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**INB373 WEB APPLICATION DEVELOPMENT**  
This unit will provide you with an understanding of the issues, structure and technologies used for developing web-based systems. The unit will provide you with the theoretical and practical skills needed to develop enterprise critical applications designed with an n-tier architecture using state of the art technologies. A comparative technology approach is taken, including an analysis of how web technologies have evolved to date, in order to identify common themes and to better enable you to comprehend and critically evaluate future web technology offerings.

**Prerequisites:** INB271 or ITB007  
**Antirequisites:** INN373  
**Equivalents:** ITB716 and ITN716  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**INB381 MODELLING AND ANIMATION TECHNIQUES**  
The unit will provide you with the knowledge and skills to use an industry standard graphics API to implement graphics applications and to develop a basic real time animation system using an industry standard language.

**Prerequisites:** INB371 and MAB281  
**Equivalents:** ITB746  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1 and 2010 SEM-2

**INB382 REAL TIME RENDERING TECHNIQUES**  
This unit will provide you with knowledge and skills in basic to advanced techniques in real-time rendering using shading languages. You will be able to implement a high-quality real-time rendering system in an industry standard
ITB003 OBJECT ORIENTED PROGRAMMING
Object Oriented Programming aims to develop your software design and development skills gained in ITB001, taking you from "procedural" programming and problem solving into an Object Oriented approach. This unit is required by all IT majors, and is designed to be complimentary to ITB008: Modelling, Analysis and Design. You will use industry standard design approaches coupled with an "industrial strength" OO programming language to design and implement a "real-life" software application. Along the way, you will gain a solid foundation in the principals of OOP, including encapsulation, polymorphism and inheritance, allowing you to solve real-world problems using the Object-Oriented design paradigm.
Prerequisite(s): ITB001 Credit points: 12 Contact hours: 4 Campus: Gardens Point and Carseldine Teaching period: 2007 SEM-1 and 2007 SEM-2 Incompatible with: ITB112

ITB004 DATABASE SYSTEMS
The aim of this unit is to introduce you to the structure and role of databases in modern businesses.
Prerequisite(s): Nil Credit points: 12 Contact hours: 3 Campus: Gardens Point and Carseldine Teaching period: 2007 SEM-1 and 2007 SEM-2 Incompatible with: ITB115

ITB006 NETWORKS
The aim of the unit is to provide an introductory study of computer networks within the IT profession.
Prerequisite(s): Nil Credit points: 12 Contact hours: 3 Campus: Gardens Point Teaching period: 2007 SEM-1, 2007 SEM-2 and 2007 SUMMER Incompatible with: ITB114

MAB131 ENGINEERING MATHEMATICS 1A
This unit includes the following: sine and cosine functions; logarithmic functions; exponential functions; revision of complex numbers; determinants; vector algebra in 2 and 3 dimensions; derivatives and their applications; differentiation; chain rule; higher derivatives; integrals and their applications.
Prerequisite(s): At least SA in both Senior Mathematics B and Senior Mathematics C or MAB100 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2007 SEM-1 and 2007 SEM-2 Incompatible with: MAB180
MAB131 ENGINEERING MATHEMATICS 1A
This unit includes the following: trigonometry, complex numbers, differentiation with applications, integration with applications, matrices, linear systems and vector algebra. Students must have completed at least four semesters of both Senior Mathematics B and C with an exit level of Sound Achievement (or equivalent).
Prerequisite(s): At least SA in both Senior Mathematics B and Senior Mathematics C or MAB100  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2009 SEM-1  Incompatible with: MAB180

MAB131 ENGINEERING MATHEMATICS 1A
This unit includes the following: sine and cosine functions; logarithmic functions; exponential functions; revision of complex numbers; determinants; vector algebra in 2 and 3 dimensions; derivatives and their applications; differentiation; chain rule; higher derivatives; integrals and their applications.
Prerequisite(s): At least SA in both Senior Mathematics B and Senior Mathematics C or MAB100  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2008 SEM-1  Incompatible with: MAB180

MAB132 ENGINEERING MATHEMATICS 2A
This unit includes the following: vector calculus; differentiation of vectors; velocity and acceleration; relative velocity; vector algebra; equivalent systems of forces; functions of several variables; partial derivatives; hyperbolic functions; inverse functions; inverse trigonometric and hyperbolic functions; partial derivatives; numerical methods; differential equations; multiple integrals; areas and volumes; Laplace transforms; Fourier series.
Prerequisite(s): MAB131  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2009 SEM-2  Incompatible with: MAB182

MAB132 ENGINEERING MATHEMATICS 2A
This unit includes the following: vector calculus; differentiation of vectors; velocity and acceleration; relative velocity; vector algebra; equivalent systems of forces; functions of several variables; partial derivatives; hyperbolic functions; inverse functions; inverse trigonometric and hyperbolic functions; partial derivatives; numerical methods; differential equations; multiple integrals; areas and volumes; Laplace transforms; Fourier series.
Prerequisite(s): MAB131  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2007 SEM-2  Incompatible with: MAB182

MAB132 ENGINEERING MATHEMATICS 2A
This unit includes the following: vector calculus; differentiation of vectors; velocity and acceleration; relative velocity; vector algebra; equivalent systems of forces; functions of several variables; partial derivatives; hyperbolic functions; inverse functions; inverse trigonometric and hyperbolic functions; partial derivatives; numerical methods; differential equations; multiple integrals; areas and volumes; Laplace transforms; Fourier series.
Prerequisite(s): MAB131  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2007 SEM-2  Incompatible with: MAB182

MAB180 ENGINEERING MATHEMATICS 1B
This unit includes: sine and cosine functions; logarithmic functions; exponential functions; complex numbers; determinants; vector algebra in 2 and 3 dimensions; derivatives and their applications (differentiation, chain rule, higher derivatives); integrals and their applications.
Prerequisite(s): At least SA in Senior Mathematics B (four semesters) or equivalent or MAB105  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2007 SEM-1 and 2007 SEM-2  Incompatible with: MAB131, HA in Senior Mathematics C

MAB180 ENGINEERING MATHEMATICS 1B
This unit includes: sine and cosine functions; logarithmic functions; exponential functions; complex numbers; determinants; vector algebra in 2 and 3 dimensions; derivatives and their applications (differentiation, chain rule, higher derivatives); integrals and their applications.
Prerequisite(s): At least SA in Senior Mathematics B (four semesters) or equivalent or MAB105  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2008 SEM-1 and 2008 SEM-2  Incompatible with: MAB131, HA in Senior Mathematics C

MAB180 ENGINEERING MATHEMATICS 1B
This unit includes: sine and cosine functions; logarithmic functions; exponential functions; complex numbers; determinants; vector algebra in 2 and 3 dimensions; derivatives and their applications (differentiation, chain rule, higher derivatives); integrals and their applications.
Prerequisite(s): At least SA in Senior Mathematics B (four semesters) or equivalent or MAB105  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2008 SEM-1 and 2008 SEM-2  Incompatible with: MAB131, HA in Senior Mathematics C

MAB182 ENGINEERING MATHEMATICS 2B
Vector calculus: differentiation of vectors, velocity and acceleration. Functions of several variables: domain, range...
and graphs, partial derivatives. Hyperbolic functions: inverse
functions, inverse trigonometric and hyperbolic functions,
Taylor expansions. Differential equations: solving certain
first and second order ODE’s, Laplace transform methods,
Fourier series. Multiple integrals: areas and volumes.
Prerequisite(s): MAB180 Contact hours: 4 per week
Campus: Gardens Point Teaching period: 2007 SEM-1,
2007 SEM-2 and 2007 SUMMER Incompatible with:
MAB112, MAB132

MAB182 ENGINEERING MATHEMATICS 2B
Vector calculus: differentiation of vectors, velocity and
acceleration. Functions of several variables: domain, range
and graphs, partial derivatives. Hyperbolic functions: inverse
functions, inverse trigonometric and hyperbolic functions,
Taylor expansions. Differential equations: solving certain
first and second order ODE’s, Laplace transform methods,
Fourier series. Multiple integrals: areas and volumes.
Prerequisite(s): MAB180 Contact hours: 4 per week
Campus: Gardens Point Teaching period: 2008 SEM-1,
2008 SEM-2 and 2008 SUMMER Incompatible with:
MAB112, MAB132

MAB182 ENGINEERING MATHEMATICS 2B
Vector calculus: differentiation of vectors, velocity and
acceleration. Functions of several variables: domain, range
and graphs, partial derivatives. Hyperbolic functions: inverse
functions, inverse trigonometric and hyperbolic functions,
Taylor expansions. Differential equations: solving certain
first and second order ODE’s, Laplace transform methods,
Fourier series. Multiple integrals: areas and volumes.
Incompatible with MAB132.
Prerequisite(s): MAB180 Credit points: 12 Contact
hours: 4 per week Campus: Gardens Point Teaching
period: 2009 SEM-1, 2009 SEM-2 and 2009 SUM
Incompatible with: MAB112, MAB132

MAB233 ENGINEERING MATHEMATICS 3
This unit is mostly introductory statistics for engineering but
also includes a small component on foundations of
computational mathematics. Statistics includes: the
planning, execution, analysis and reporting of data
investigations; use of a statistical package; modelling data;
relationships between variables; estimation; confidence
intervals; tolerance limits; hypothesis testing; fitting and
investigating relationships; regression; design and analysis
of experiments; risk; random variables; special distributions;
linear combinations of correlated variables; reliability. The
introduction to computational mathematics includes:
function approximation; polynomial interpolation; numerical
solution of ordinary differential equations.
Prerequisites: MAB131 or MAB182 or MAB121 or MAB126
or MAB127 Antirequisites: BSB123 Credit points: 12
Contact hours: 4 per week Campus: Gardens Point
Teaching period: 2010 SEM-1

PCB136 ENGINEERING PHYSICS 1C
This introductory unit covers: dynamics (motion in 1D,
vectors, Newton’s Laws, motion in 2D (including circular
motion), uniform circular motion, work, energy and power
potential energy and conservation of energy, linear
momentum and collisions); waves (oscillatory motion, wave
motion, sound waves, superposition and standing waves);
geometrical optics (reflection, refraction, dispersion,
Huygens’ principle, image formation by mirrors and lenses,
optical instruments); physical optics (interference of light,
diffraction); thermal physics (temperature, thermometry,
thermal expansion, heat and thermal energy, heat capacity
and specific heat, latent heat, heat transfer).
Contact hours: 4 per week Campus: Gardens Point
Teaching period: 2008 SEM-1 and 2008 SEM-2

PCB136 ENGINEERING PHYSICS 1C
This introductory unit covers: dynamics (motion in 1D,
vectors, Newton’s Laws, motion in 2D (including circular
motion), uniform circular motion, work, energy and power
potential energy and conservation of energy, linear
momentum and collisions); waves (oscillatory motion, wave
motion, sound waves, superposition and standing waves);
geometrical optics (reflection, refraction, dispersion,
Huygens’ principle, image formation by mirrors and lenses,
optical instruments); physical optics (interference of light,
diffraction); thermal physics (temperature, thermometry,
thermal expansion, heat and thermal energy, heat capacity
and specific heat, latent heat, heat transfer).
Credit points: 12 Contact hours: 4 per week Campus:
Gardens Point Teaching period: 2009 SEM-1 and 2009
SEM-2